

HUMAN RESOURCES RESEARCH ORGANIZATION ALEXANDRIA VA
MINE HOIST OPERATOR TRAINING PROGRAM. TEST ANSWERS.(U)
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Mine Hoist Operator
Training Program.
Test Answers

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Mine Hoist Operator Training Program			
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The purpose of this program is to train and re-train mine hoist operators. The training is in three parts. Part I the student will learn the basic components and operations of a mine hoist; in Part II the student will learn the specific components of the hoist they are being trained to operate; and Part III the student will become skilled in operating their assigned hoist. This is the Test Question Booklet and Test Answer Booklet are separate.			

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ANSWERS TO MINE HOIST TEST QUESTIONS

1. lower men and materials into the mine, and raise men, materials, ore and waste out of the mine.

	<u>Name of Part</u>	<u>Number of Explanation</u>
2.	A Control	9
3.	B Clutch	4
4.	C Hoist Motor	3
5.	D Brake	10
6.	E Drum or Wheel	6
7.	F. Bull Gear & Pinion Gear	5
8.	G. Head Sheave	11
9.	H. Headframe	12
10.	I. Rope	7
11.	J. Dump Area	1
12.	K. Collar	13
13.	L. Conveyance	14
14.	M. Work Level	8
15.	N. Shaft	2

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Availability Codes	
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Dist. Special	
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ANSWERS TO THE HYDRAULIC SYSTEM TEST QUESTIONS

1. engage or disengage the clutch or brake.

	<u>Name of Part</u>	<u>Number of Explanation</u>
2.	A. Drive Motor Control	3
3.	B. Drive Motor	7
4.	C. Hydraulic Pump	6
5.	D. Oil Sump	2
6.	E. Operating Control	1
7.	F. Accumulator	5
8.	G. Operating Mechanism	4
9.	H. Piston	8

10. operating mechanism.

11. clutch.

12. sump.

13. downward.

14. downward.

15. drive motor.

16. accumulator.

17. accumulator piston.

18. shuts off the drive motor.

ANSWERS TO SHAFT TEST QUESTIONS

1. d - all of the above

	<u>Name of Part</u>	<u>Number of Explanation</u>
2.	A. Collar	4
3.	B. Lining	1
4.	C. Guides	5
5.	D. Safety Gate	6
6.	E. Landing or Station	3
7.	F. Dump Area	2
8.	G. Utility Pipes and Cables	7

9. a. - substantial safety gates

10. d. - b and c

11. d. - a, b and c

12. c. - entrance to the shaft

13. a. - closed

14. d. - a and b

15. b. - 7 days

16. d. - all of the above

17. d. - all of the above

18. b. - daily

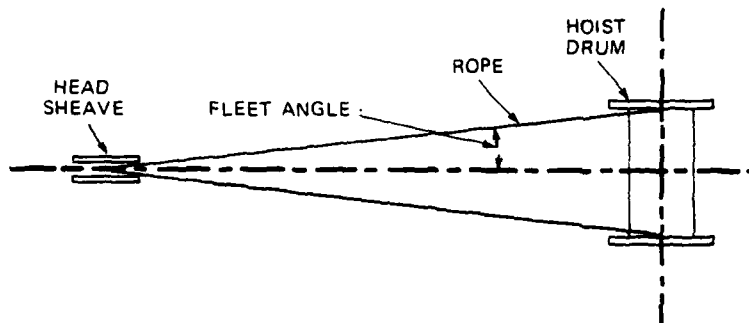
19. e. - all of the above

ANSWERS TO CONVEYANCE TEST QUESTIONS

1. e. - b and c
2. d. - a and c
3. d. - all of the above
4. I. Bottom-Dump Skip
 - A. Scroll
 - B. Dump Roller
 - C. Bucket
 - D. Bail
 - E. GateII. Upside-Down Dumping Skip
 - A. Latch
 - B. Dump Roller
 - C. Bucket
 - D. Bail
5. Car
6. Cage
 - A. Bonnet
 - B. Safety Dogs
 - C. Guide Shoe
 - D. Man Compartment
7. d. - a and b
8. b. - bail
9. b. - track or scroll; d. - dump roller
10. c. - guide shoe
11. d. - safety dog
12. b. - man compartment
13. a. - bonnet
14. b. - slack appears in the hoist rope
15. d. - all of the above
16. b. - tailrope
17. a. - bonnet
18. e. - a and b
19. d. - a and b
20. c. - locking device to prevent tilting

ANSWERS TO HEADFRAME TEST QUESTIONS

1. support the headsheave or Koepe wheel over a shaft.
2.
 - A. headsheave
 - B. hoist drum
 - C. wire rope
 - D. headframe
3.
 - A. head (Koepe) wheel
 - B. headframe
 - C. shaft
- 4.



5. c. - rope
6. c. - not be greater than 1 1/2 degrees for smooth drums or greater than 2 degrees for grooved drums.

ANSWERS TO SHEAVE TEST QUESTIONS

1. rope
2. A. Groove
B. Diameter
3. b. - head; d. - knuckle or curve; e. - idler
4. d. - all of the above
5. d. - b and c
6. c. - rope to bend sharply and possibly break wires
7. b. - grooves
8. c. - weekly
9. b. - daily

ANSWERS TO BRAKE SYSTEM TEST QUESTIONS

1. brakes
2. c. - pads; d. - disc
3. b. - weight; a. - drawbar
4. c. - ring
5. d. - a and c
6. d. - all of the above
7. a. - accidental withdrawal of the clutch
8. brakes
9. d. - a and b

ANSWERS TO CLUTCH TEST QUESTIONS

1. c. - engage or disengage the drum from the hoist motor
2. A. clutch ring
B. operating mechanism
C. clutch spider
3. b. - teeth of the ring
e. - teeth of the spider
a. - drum
OR
e. - teeth of the spider
b. - teeth of the ring
a. - drum
4. A. friction block
B. band
C. spider
D. clutch ring
E. shaft
F. drum
5. d. - friction blocks
b. - clutch ring
a. - drum
6. e. - a and b

ANSWERS TO HOIST DRUM OR WHEEL ASSEMBLY TEST QUESTIONS

1. the hoist rope into and out of the mine.
2. A. Riser
B. Flange
C. Groove
3. A. Wheel
B. Liner
4. b. - grooves
5. b. - flanges
6. d. - risers
7. c. - liner
8. A. Parallel
B. Helical
C. LeBus
9. A. Single drum, two conveyance
B. Koepe Wheel
C. Single drum, one conveyance
D. Double drum
10. a. - 4 inches
11. b. - rope

ANSWERS TO WIRE ROPE TEST QUESTIONS

1. d. - a, b, c
2. e. - a and b
3. e. - c and d
4. E. - left lay
5. A. - lay
6. B. - right lay
7. G. - core
8. F. - regular lay
9. C. - lang lay
10. H. - crown wires
11. The rope has 2 strands of 6 wires each.
12. A.
13. A. right lay
B. left lay
14. A. lang lay
B. regular lay
15. A. strand
B. wire
C. core
16. A. sharp bends
B. reverse bending
C. kinking
17. b. - seizing
18. e. - eye; a. - end; d. - thimble
19. e. - all of the above
20. b. - dead; c. - bitter; a. - live; d. - working

21. 1. - C
2. - B
3. - E
4. - A
5. - D

22. 1. - D
2. - A
3. - B
4. - C

23. 1. - A
2. - D
3. - B
4. - C

24. 1. - C
2. - E
3. - A
4. - B
5. - D

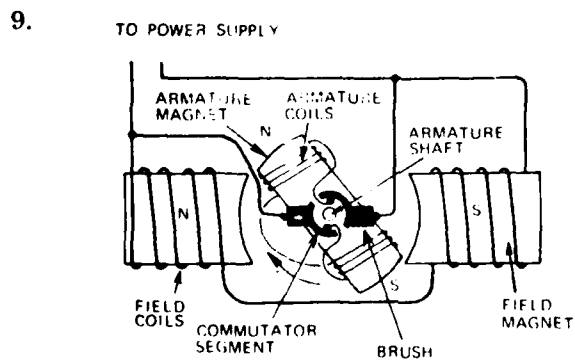
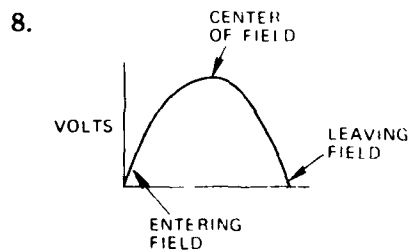
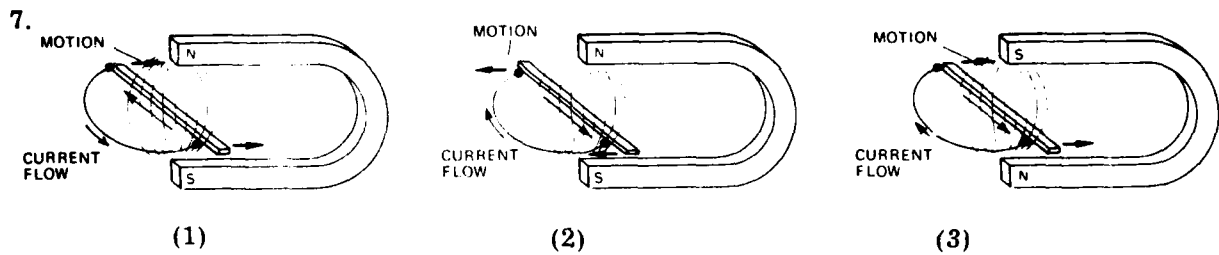
25. e. - all of the above

26. e. - all of the above

27. 10

ANSWERS TO ELECTRICAL TEST QUESTIONS (General)

1. electricity, current, amperes
2. increase; brighter
3. B
4. A. alternating current;
B. direct current
5. electromagnet;
bottom
6. S; N



I

10. High Output; Low Output

11. High High
Medium Medium
Low Low

12. open

13. low

14. out of

15. changing or reversing

16. sealed

17. overheat

18. grounded

ANSWERS TO DEPTH INDICATOR TEST QUESTIONS

1. a. the vertical position of the conveyance in the shaft.
2. A. Dial; B. Cylindrical
3. b. arrow; d. dial
4. e. b and c
5. c. the arrow on the dial points to that position
6. a. moves up and down the threaded shaft
7. c. the cylinder indicator stops over the mark for that position
8. d. flanges of the drum
9. e. all of the above
10. e. all of the above
11. b. hoisting engineer
12. b. daily

ANSWERS TO SAFETY CONTROLLER TEST QUESTIONS

1. e. - all of the above
2. b. - overspeeds
c. - move outward
3. a. - overtravel
4. d. - a and b
5. b. - cruising
6. left picture is governor; right picture is depth indicator

ANSWERS TO CONTROL PANEL TEST QUESTIONS

1. panel.
2.
 - A. Depth indicator
 - B. Indicator lights
 - C. Control pushbutton
 - D. Brake and clutch lever
 - E. Deadman switch
 - F. Motor control lever
 - G. Meter
3. (in any order)
 - a. - show the condition of the bypass switches
 - c. - show clutches engaged or disengaged
 - e. - show safety gates opened or closed
4. (in any order)
 - a. - clutch control
 - b. - hoist motor control
 - d. - electric brakes
5. (in any order)
 - b. - rope speed
 - c. - current flow or voltage
 - d. - lubrication oil, air or hydraulic pressure
6. b. - position of conveyance in the shaft
7.
 - A. Double drum, single clutch
 - B. Single drum
 - C. Double drum, double clutch
8. e. - all of the above
9. b. - won't prevent hoistman from hearing signals
10. e. - all of the above
11. b. - daily

ANSWERS TO COMMUNICATION SYSTEM QUESTIONS

1. e. - all of the above
2. B. telephone or radio
3. E. meters and gauges
4. A. hoist bell
5. F. closed circuit T.V.
6. D. indicator lights
7. C. public address
8. e. - a or c
9. b. - regular signaling system
10. c. - only from authorized persons
11. b. - signal the hoist operator
12. a. - standard code
13. c. "one bell"
14. d. - a, b, c
15. e. - all of the above
16. e. - a or c
17. b. - heard by the hoisting engineer at all times
18. b. - daily

ANSWERS TO LUBRICATION TEST QUESTIONS

1. wear on surfaces that rub together
2. oil; grease
3. c. - bearings
4. b. - joints
5. d. - surfaces that rub together
6. Figure 1 — Oil Reservoir; Figure 2 — Grease Gun; Figure 3 — Oil Flow
7. A. dipstick
B. sight glass
C. reservoir or sump
8. A. bearing
B. shaft
9. A. gauge
B. oil pump
C. reservoir or sump
10. e. - all of the above
11. d. - all of the above
12. c. - as recommended or approved by the rope manufacturer
13. c. - weekly
14. d. - all of the above

ANSWERS TO INSPECTION TEST QUESTIONS

1. d. - all of the above
2. e. - all of the above
3. d. - a and c
4. b. - a malfunction
5. c. - a and b
6. e. - a and b
7. e. - all of the above
8. c. - once
9. c. - seven (7) days
10. a. - 24 hour
11. b. - 7 days
12. b. - weekly
13. e. - a, b, d
14. c. - month
15. e. - all of the above
16. e. - all of the above
17. c. - one year unless a shorter time is required by standard 57.19-126 or by conditions of use
18. e. - all of the above
19. d. - b and c
20. a. - drum
21. d. - a and c
22. d. - all of the above
23. d. - all of the above
24. e. - a and b
25. b. - daily

ANSWERS TO MAINTENANCE TEST QUESTIONS

1. repaired and in safe operating condition.
2. d. - all of the above
3. b. - preventive
4. c. - corrective
5. e. - all of the above
6. d. - all of the above
7. d. - b and c
8. c. - substantial platforms equipped with bonnets or equivalent overhead protection

ANSWERS TO SAFETY FEATURES TEST QUESTIONS

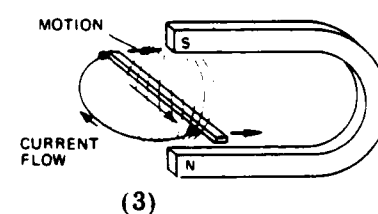
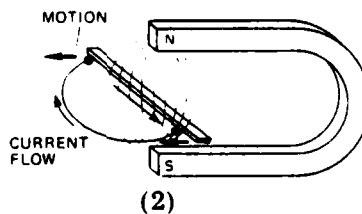
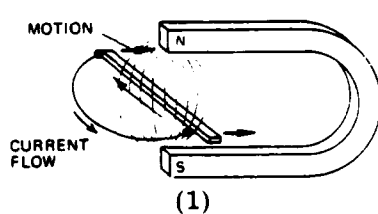
1. E - slack rope switch
2. J - safety dog
3. H - overspeed control
4. D - overtravel control
5. F - clutch-brake interlock
6. A - cage bonnet
7. G - safety gate
8. I - communication systems
9. B - deadman switch
10. C - rope strength
11. d - all of the above
12. e. - all of the above
13. e. - all of the above

ANSWERS TO ELECTRICAL TEST QUESTIONS (Fundamental)

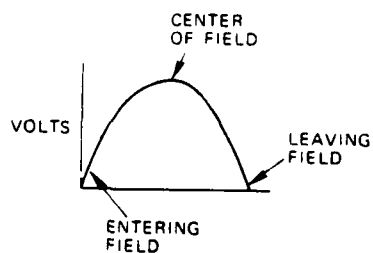
1. D. voltage
2. H. current
3. A. resistance
4. F. symbol for volts
5. E. symbol for amperes
6. C. symbol for resistance
7. volt
8. ampere
9. ohm
10. conductor
11. $E = IR$
12. $\frac{240}{12} = 20$ amperes
13. $125 = 25 \times R$; $R = 5$ amps
14. 26 amperes
15. 5 amperes
16. d. - a and c
17. e. - nonexistent
18. c. - circular mil
19. b. - ammeter
20. a. - voltmeter
21. 1,800 foot pounds per second
22. 5,950 foot pounds
23. $W = 50 \times 5 \times 10 = 2500$ foot pounds
24. c. - 550; d. - 33,000

25. 100 horsepower
26. 55,950
27. 7
28. 3,300
29. 4,400 watt hours
30. 1,650 watts or 1.65 kilowatts
31. d. - watt hour meter
32. 6,480
33. b. - voltage; d. amperage
34. 100 watts
35. d. - all of the above
36. electromagnet;
Bottom
37. South; North

38.



39.



40. c. - increases
41. alternating; direct
42. d. - alternating; a. - direct

43. a. - rheostat
44. b. - generator or dynamo; a. - electric motor
45. c. - brushes, armature, commutator, field magnets
46. d. - reverses the poles of the magnet
47. b. - is reversed
48. a. - increasing the armature current
49. d. - decreasing the armature current
50. a. - field coils
51. High; Low
52.

High	High
Medium	Medium
Low	Low
53. d. - copper
54. a. - carbon
55. c. - pigtail
56. c. - changing the position of the brush
57. d. - a and c
58. b. - commutator
59. b. - strength of the field
60. a. - an induced voltage
61. c. - high
62. c. - armature
63. b. - can cause damage
64. d. - burn the armature coils
65. d. - b and c
66. a. - shunt
67. c. - series

68. b. - compound
69. b. - exciter generator
70. c. - reducing the voltage to the motor armature
71. d. - b and c
72. b. - step-up transformer; a. - step-down transformer
73. a. - high voltage; b. - low voltage;
74. c. - laminations
75. d. - all of the above
76. a. - secondary coil
77. a. - secondary coil
78. c. - about equal to
79. c. - turns of wire in each coil
80. 1100; 10
81. 50
82. 22
83. d. - a and b
84. a. - be enclosed
85. d. - a and c
86. c. - electrolysis
87. b. grounding
88. c. - fuse
89. breaks the circuit
90. a. - circuit breaker
91. c. - lightning arrester
92. 275
93. d. - b and c

ANSWERS TO BEGINNING OF SHIFT ACTIVITIES TEST QUESTIONS

1. E and F
2. G and H
3. A, B and C
4. D, I and J
5. talking to previous operator; reading the log.
6. e. - all of the above
7. e. - a, b and c
8. d. - all of the above
9. A. reservoir
B. pump
C. leaks
D. oil flow
E. assistance
10. A. reservoir
B. leaks
C. assistance
11. 2
3
1
4
12. b. - his/her foot or knee is not pressing the switch
13. D
B
C
E
C
A
14. 4
1
2
3

15. 2
3
4
1
7
6
5

ANSWERS TO ROUTINE SHIFT ACTIVITIES TEST QUESTIONS

1. conveyance; safely.
2. 3
5
4
1
2
3. b. - closed (turned on)
4. a. - slowly; c. - release
5. c, d or d, c
6. e. - all of the above
7. b or d; d or b
8. b. - depth indicator; c. - drum
9. b. - cuts off the power
10. shift changes
11. 2
4
1
3
5
12. 2
1
3
13. 2
1
3
5
4
14. 4
1
2
3
15. c. - pushing the STOP button
16. b. - pushing the correct button

ANSWERS TO EMERGENCY PROCEDURES TEST QUESTIONS

1. d. - all of the above
2. e. - b or c
3. e. - all of the above
4. 5
1
4
2
3
5. 1
3
2
6. 3
2
1
7. 2
3
6
4
1
5
8. d. - all of the above
9. b. - all personnel are clear of the endangered area
10. air supply

ANSWERS TO END OF SHIFT TEST QUESTIONS

1. e. - all of the above
2. d. - b and c
3. a. - sets the brake
b. - sets the motor control on OFF
c. - checks that conveyances balance
e. - turns the power switch off

ANSWERS TO TEST FEDERAL REGULATIONS QUESTIONS

The article number is given with the answer for reference only.

1. 57.19-57 — c. - 12 months
2. 57.19-55 — c. at all times while any person is underground
3. 57.19-56 — c. while any person is underground
4. 57.19-63 — authorized
5. 57.19-58 — e. - a and c
6. 57.19-67 — authorized
7. 57.19-66 — a. - maximum number of persons permitted to ride in a hoisting conveyance at one time
8. 57.19-68 — d. - all of the above
9. 57.19-69 — d. - b and c
10. 57.19-70 — closed
11. 57.19-70 — stop
12. 57.19-71 — e. - all of the above
13. 57.19-74 — e. - all of the above
14. 57.19-60 — caution
15. 57.19-61 — safe; exceeded
16. 57.19-61 — b. - 2,500 feet per minute
17. 57.19-76 — d. - 100 feet
18. 57.19-62 — b. - not exceed 6 feet per second per second
19. 57.19-65 — emergencies
20. 57.19-72 — e. - b, c, d
21. 57.19-73 — c. - unless compartments and bins are partitioned to prevent spillage
22. 57.19-75 — d. - all of the above

- 23. 57.19-77 — d. - shaft bottom
- 24. 57.19-78 — e. - all of the above
- 25. 57.19-79 — d. - a and b
- 26. 57.19-80 — a. - they won't strike the sides of the shaft
- 27. 57.19-81 — c. - to prevent persons from boarding or loading the conveyance
- 28. person
- 29. d. - all of the above
- 30. e. - b and c